*भारतीय मानक*
***Indian Standard***

**IS 1872 : 2020**

# विमानों के लिए संश्लेषिक रंग रोग़न के लिए थिंनर तथा वार्निश — विशिष्टि

*( पहला पुनरीक्षण )*

# Thinner for Synthetic Paints and Varnishes for Aircrafts — Specification

*( First Revision )*

ICS 87.040

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भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
मानक भवन, 9 बहादुरशाह ज़फर मार्ग, नई दिल्ली – 110002
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI-110002
www.bis.gov.in www.standardsbis.in

**June 2020** **Price Group 2**

Raw Materials for Paints, Varnishes and Related Products Sectional Committee, CHD 21

## FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Raw Materials for Paints, Varnishes and Related Products Sectional Committee, had been approved by the Chemical Division Council.

This standard was first published in 1961. Thinners for synthetic paints and varnishes vary in composition from one manufacturer to another. With the growth of the aircraft manufacturing industry in this country, the need for evolving a suitable standard to serve the special requirements of thinner used in this industry was felt by the Committee responsible for formulation of this standard. This specification is intended to serve as a guide in evaluating the quality of thinner.

Raw material for paint products may contain lead and other toxic heavy metals either because of their use as catalyst or use of heavy metal other than lead based compounds in manufacturing. Taking cognizance of the fact that lead and toxic heavy metal exposure of human being, particularly children in residential premises is injurious to health and having adverse impact on human health and safety, the Committee responsible for formulation of this standard has felt the need to introduce restriction of lead and toxic heavy metal restriction in all paint raw material product standards. Revision of this standard has been taken up with a view to incorporate the maximum permissible limit of lead and heavy metal restriction clause in this standard. Therefore, in this revision, lead restriction up to a maximum permissible limit of 90 ppm and toxic heavy metals restriction as 0.1 percent maximum has been prescribed to avoid hazardous impact of lead and toxic heavy metals exposure and consequent adverse impact on environment and human health. Further, majority of consumers are not aware of the consequences of lead and other heavy metal toxicity and its long-term implications to human health. Therefore, in this revision, along with lead and heavy metal restriction, a suitable cautionary notice has been included in the marking clause.

This standard is one of a series of Indian Standards for aircraft paint and varnish materials. The other Indian Standard Specifications in this series is:

| | |
|---|---|
| IS 1873 | Antichill thinner for cellulose nitrate based paints, dopes and lacquers for aircrafts |

This standard is intended mainly to cover the technical provisions relating to thinner for synthetic paints and varnishes and it does not include all the necessary provisions of the contract.

This standard was formulated by CHD 21 technical committee. The list of experts who had made significant contribution to the formulation of this standard is given at Annex C.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 1960 ‘Rules for rounding off numerical values ( *revised* )’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

# *Indian Standard*

# THINNER FOR SYNTHETIC PAINTS AND VARNISHES FOR AIRCRAFTS — SPECIFICATION

## *( First Revision )*

## 1 SCOPE

This standard prescribes the requirements, sampling and the methods of test for thinner for synthetic paints and varnishes. The thinner is intended for use in the aircraft industry**.**

## 2 REFERENCES

The Indian Standards listed in Annex A contain provisions which through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards. Wherever a reference to any Indian Standard appears in this specification, it shall be taken as a reference to the latest version of the Standard.

## 3 TERMINOLOGY

For the purpose of this specification, the definitions given in IS 1303 shall apply.

## 4 REQUIREMENTS

### 4.1 Description

The material shall consist only of organic solvent and shall be clear and free from sediment and suspended matter.

**4.1.1** The material shall consist of the ingredients mixed in the proportions by volume prescribed against each are as follows:

| | |
|---|---|
| a) Xylole | 9 parts |
| d) n-Butyl alcohol (conforming to IS 361) | 1 part |

### 4.2 Odour

The material shall not leave any appreciable residual odour after drying filter paper.

### 4.3 Spot Test

The material shall show complete evaporation from white filter paper without leaving a stain or oily spot.

### 4.4 Lead Restriction

The material shall be tested for restriction from lead in accordance with IS 101 (Part 8/Sec 5), or by atomic absorption spectrometer or by ICP. When thus tested the material shall not contain lead or compounds of lead or mixtures of both, calculated as metallic lead exceeding 90 ppm (*see* Note).

NOTE — When no lead is used during production (lead free).

### 4.5 Toxic Heavy Metal Restriction

Product shall not be manufactured using mercury and mercury compounds, cadmium, chromium VI, arsenic, antimony and their oxides. The material shall not contain more than 0.1 percent by weight in total of above toxic heavy metals in the form of natural impurities or impurities entailed by the production process which are contained in the raw material when tested by the relevant atomic absorption spectroscopic methods.

**4.6** The material shall also conform to the requirements given in Table 1.

## 5 KEEPING QUALITY

The keeping qualities shall be such that when stored under cover in dry place in the original containers under normal temperature conditions, the material shall retain the original characteristics like colour, odour, specific gravity, copper corrosion and residue on evaporation for not less than 12 months after the date of manufacture.

## 6 PACKING AND MARKING

### 6.1 Packing

**6.1.1** Unless otherwise agreed to between the purchaser and the supplier, the material shall be packed in tin containers conforming to IS 1406.

**6.1.2** All containers for storage and transport of the material, since classified as inflammable and dangerous goods, shall, in addition, comply with the requirements of the latest issue of Red Tariff and the requirements as laid down from time to time by the Petroleum and

Explosives Safety Organization (PESO), Government of India, for packing, storage and transit of Inflammable Liquids and the Board of Trade Regulations as applicable thereon for transport by steamers.

### 6.2 Marking

**6.2.1** The containers shall be securely closed and marked with following details:

a) Name of the material;
b) Manufacturer's name and trade-mark, if any;
c) Lead content (maximum);
d) Toxic heavy metals content;
e) Volume of the material;
f) Batch number or lot number in code or otherwise;
g) Month and year of manufacture; and
h) A cautionary note as below:
    1) Keep out of reach of children; and
    2) This product may be harmful if swallowed or inhaled.

**6.2.2** The containers shall also be marked 'HIGHLY INFLAMMABLE LIQUID' in clearly legible and bold red letters and with 'flash point of the material'.

**6.2.3** *BIS Certification Marking*

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

## 7 SAMPLING

**7.1** The supplier shall submit the necessary tender samples packed indifferent containers, each sample in duplicate and each containing not less than 500 ml of the material.

**7.2** Representative sample of bulk supplies of the material shall be drawn as prescribed under **3** of IS 82.

**Table 1 Requirements of Thinners for Synthetic Paints and Varnishes for Aircrafts**

( *Clause* 4.6 )

| Sl No.<br>(1) | Characteristics<br>(2) | Requirement<br>(3) | Method of Test<br>(4) |
|---|---|---|---|
| i) | Colour | It shall be not darker than a freshly prepared solution of 0.003 g of potassium dichromate in one litre of distilled water | **5** of IS 82 |
| ii) | Specific gravity At 30°/30°C | 0.840 8 to 0.854 7 | **6** of IS 82 |
| iii) | Distillation test: | | **7** of IS 82 |
| | a) Initial boiling point | 116° to 118°C | |
| | b) Volume of distillate up to 120°C, *Max* | 10 ml | |
| | c) Volume of distillate up to 145°C (stop point), *Min* | 98 ml | |
| iv) | Residue on evaporation, *Max* | 20 mg per 100 ml | **8** of IS 82 |
| v) | Copper corrosion | The material shall not blacken or corrode clean metallic copper | **11** of IS 82 |
| vi) | Hydrocarbon content, percent by weight | 88-91 | Annex B |

# ANNEX A

( *Clause* 2 )

## LIST OF REFERRED INDIAN STANDARDS

| *IS No.* | *Title* |
|---|---|
| 82 : 1973 | Method of sampling and test for thinners and solvent for paints |
| 101 (Part 8/ Sec 5) : 1993 | Methods of sampling and test for paints, varnishes and related products: Part 8 Tests for pigments and other solids, Section 5 Lead restriction test |
| 266 : 1993 | Sulphuric acid |
| 361 : 2009 | Normal butyl alcohol, technical |
| 878 : 2008 | Laboratory glassware — Graduated measuring cylinders |
| 1070 : 1992 | Reagent grade water |
| 1303 : 1983 | Glossary of terms relating to paints |
| 1406 : 1995 | Rectangular tins for liquids |

# ANNEX B

[ *Table* 1, *Item* (vi) ]

## DETERMINATION OF HYDROCARBON CONTENT

### B-1 QUALITY OF REAGENTS

Unless specified otherwise, pure chemicals and distilled water (*see* IS 1070) shall be employed in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

### B-2 APPARATUS

**B-2.1 Stoppered Graduated Measuring Cylinder,** 100 ml capacity (*see* IS 878).

### B-3 REAGENTS

**B-3.1 Sulphuric Acid**

Mix 60 ml of concentrated sulphuric acid (*see* IS 266) and 40 ml of water.

NOTE — Care shall be taken while mixing sulphuric acid with water.

### B 4 PROCEDURE

Transfer 50 ml of the thinner sample in the measuring cylinder (**B-2.1**). To this add 50 ml of sulphuric acid previously cooled with ice and mix thoroughly. Allow the contents of the cylinder to stand undisturbed overnight or until the mixture separates into two distinct layers. The top layer insoluble in sulphuric acid consists of the hydrocarbons. Carefully record the volume of the upper layer and determine its specific gravity.

### B 5 REPORTING

From the volume of the insoluble hydrocarbon portion and the volume of the samples compute the percentage by weight of hydrocarbon content.

# ANNEX C

( *Foreword* )

## EXPERTS WHO MADE SIGNIFICANT CONTRIBUTION TO THE DEVELOPMENT OF THIS STANDARD

| *Organization* | *Representative(s)* |
|---|---|
| In personal capacity | Prof A. S. Khanna, (***Chairman***)<br>CHD 21 (Rtd from IIT Bombay) |
| Asian Paints Ltd | Dr Randhirsinh Parmar |
| Berger Paints India Ltd | Dr Tapan Dhar<br>Shri Swagata Chakraborty (*Alternate*) |
| Central Building Research Institute | Dr P. C. Thapliyal |
| Institute of Chemical Technology, Mumbai | Dr Anagha Sabnis<br>Prof P. A. Mahanwar (*Alternate*) |
| Indian lead zinc development association, New Delhi | Shri K. Sridhar |
| VOICE | Shri M. A. U. Khan<br>Shri B. K. Mukhopadhaya (*Alternate*) |
| Heubach India, Mumbai | Shri J. I. Sevak |
| Indian Small Scale Paint Association | Shri Mukund Hulyalkar<br>Shri Mukesh Goyal (*Alternate*) |
| Indian Institute of Chem. Technology, Hyderabad | Dr Ramanuj Narayen<br>Dr Pratyay Basak (*Alternate*) |
| SSPC India Chapter, Kolkata | Dr Buddhadeb Duari |
| Directorate General, BIS | Shri U. K. Das, Scientist 'E' and Head (CHD)<br>[ Representing Director General ( *Ex-officio*) ] |

*Member Secretary*

Shrishti Dixit
Scientist 'C' (CHD), BIS

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This Indian Standard has been developed from Doc No.: CHD 21 (12878).

## Amendments Issued Since Publication

| Amend No. | Date of Issue | Text Affected |
|---|---|---|
| | | |
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**BUREAU OF INDIAN STANDARDS**

**Headquarters:**

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
*Telephones*: 2323 0131, 2323 3375, 2323 9402 *Website*: www.bis.gov.in

**Regional Offices:**

| | | *Telephones* |
|---|---|---|
| Central | : Manak Bhavan, 9 Bahadur Shah Zafar Marg<br>NEW DELHI 110002 | 2323 7617<br>2323 3841 |
| Eastern | : 1/14 C.I.T. Scheme VII M, V.I.P. Road, Kankurgachi<br>KOLKATA 700054 | 2337 8499, 2337 8561<br>2337 8626, 2337 9120 |
| Northern | : Plot No. 4-A, Sector 27-B, Madhya Marg<br>CHANDIGARH 160019 | 265 0206<br>265 0290 |
| Southern | : C.I.T. Campus, IV Cross Road, CHENNAI 600113 | 2254 1216, 2254 1442<br>2254 2519, 2254 2315 |
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